



OVERVIEW RENEWABLE ENERGY AND FINANCING

**Michael T. Eckhart
American Council On Renewable Energy
Washington, DC**

**Ninth National Green Power Marketing Conference
October 4-6, 2004 Albany, NY**

ACORE's Mission and Scope

Mission: As a 501(c)(3) nonprofit organization, to bring renewable energy into the mainstream of America's economy and lifestyle through information and communications

ACORE encompasses all renewable energy options:

- Solar energy
- Wind power
- Hydropower
- Geothermal energy
- Biomass energy
- Biofuels
- Waste fuels
- Ocean energy

In all forms:

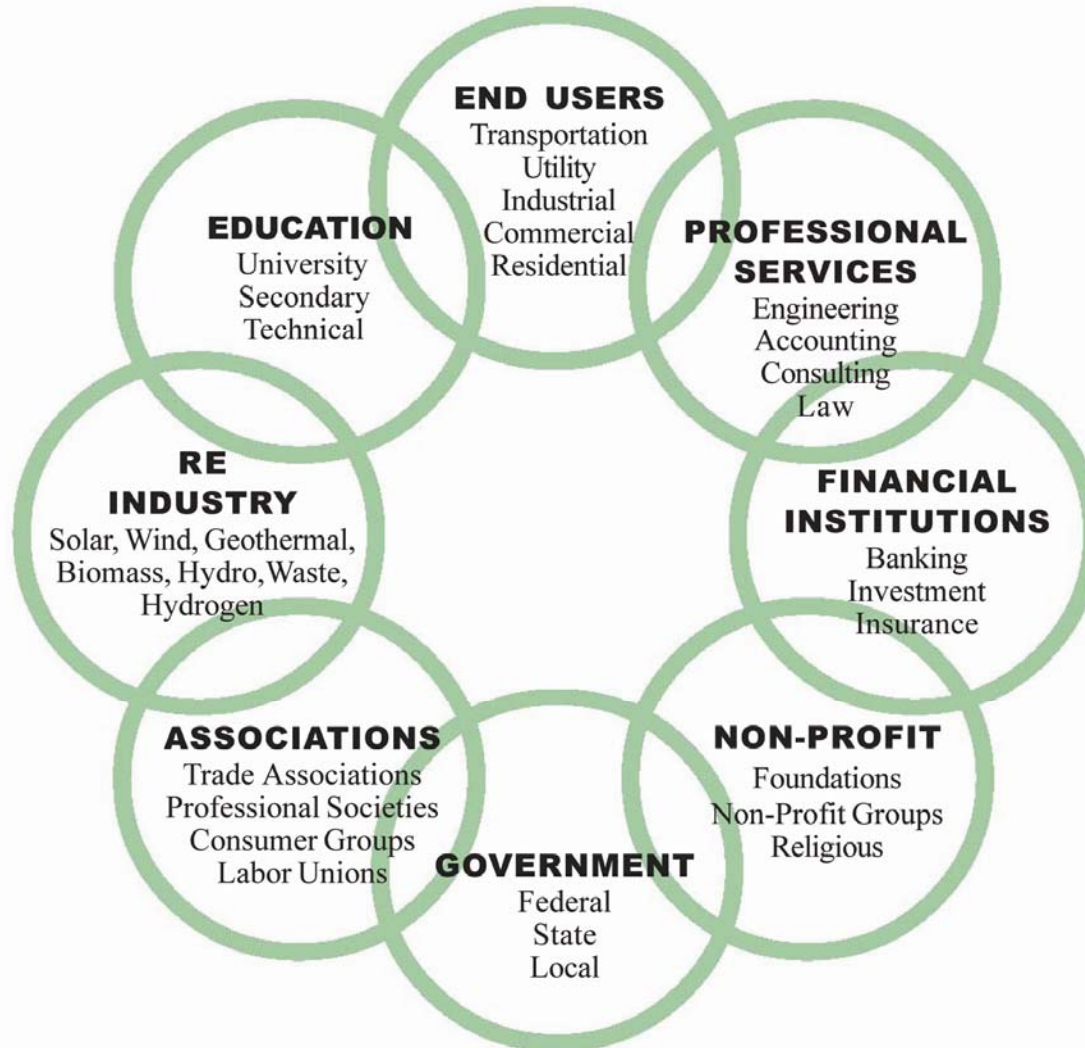
- Electricity
- Fuels
- End use energy
- Hydrogen

With linkages to related areas:

- Energy efficiency
- Environmental protection
- Economic growth
- National security

With three focal points for programs: Trade, Finance and Policy.

American Council On Renewable Energy



ACORE Membership

8-1-2004

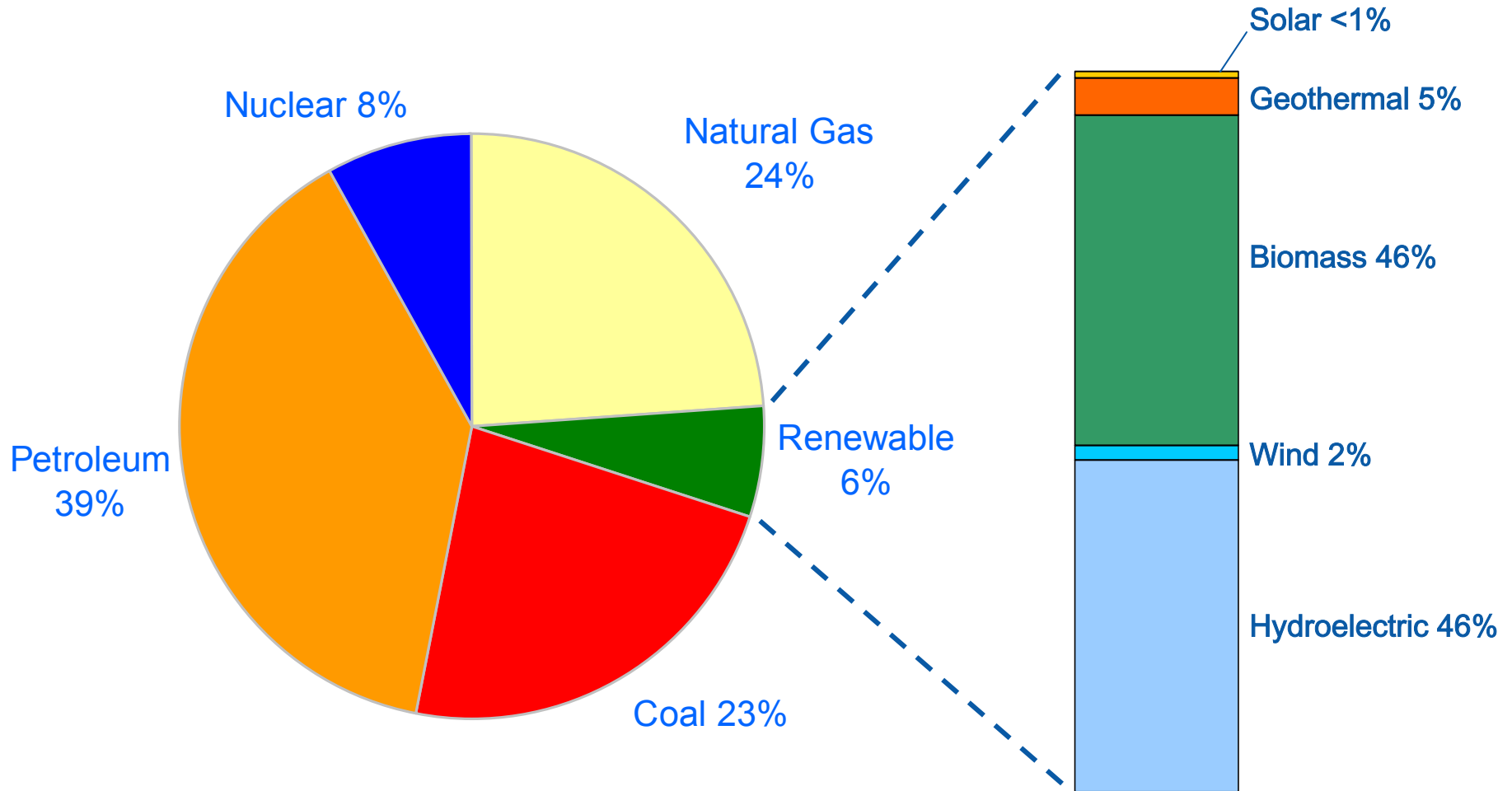
Advance Capital Markets
Advanced Alternative Energy Corp.
Alliance to Save Energy
American Bioenergy Association
Arare Venture
Arizona Public Service
Austin Energy
B.O.R. International
Baker & McKenzie
Bingham McCutchin LLP
BP Solar
C2HMHill
California Power Authority
California Energy Commission
Canadian Assoc for Renewable Energy
Capital E
Catalytics, Inc.
Chicago Climate Exchange
Clark Communications
Clean Energy Commercialization
Clean Energy Group
Clean Energy Incubator
CLF Ventures, CLF
Cohen & Company
Colorado Springs Utilities
Crossroads Energy
CUNY - Bronx Community College
Davenport Finance Company
Davis, Joseph & Negley
Distributed Energy Financial Group
DTE Energy
Dunev Capital
E3 Consulting
Eastern Research Group
Edison Electric Institute

EIF Group
Emergy Energy Company
Energy & Environmental Ventures
Energy and Security Group
Energy Financing, Inc.
Energy Innovations Inc.
Energy Strategy Associates
Environment 2004
EEAF
EPRI
ERG, LLC
Geothermal Energy Association
Evergreen Solar, Inc.
Firestar Engineering
Fredrikson & Byron, P.A.
Gas Technology Institute
GE Wind Energy
Gemstar Group, Inc.
Global Energy Network Institute
Green Strategies, Inc.
Hafslund USA
Hawaiian Electric Company, Inc.
Homeland Energy Resources Dev.
IF, LLC
Independent Energy Corporation
International Ctr for Sustainable Dev.
Interstate Renewable Energy Council
KeySpan Energy
Konarka Technologies, Inc.
Laidlaw Energy Group Inc.
Learn On Line, Inc.
Mainstay Energy
Marathon Capital
Marshall Street Management
Massachusetts Technology Collaborative

McKenzie Bay International Ltd.
McToy International Ltd.
Midwest Research Institute (MRI)
Milbank, Tweed, Hadley & McCloy LLP
Morse Associates, Inc.
National Grid USA
National Hydropower Association
Natsource
Natus Technologies Corporation
Navigant Consulting, Inc.
New Alternatives Fund Inc.
New Uses Council
Next Wave Energy, Inc.
Northern Power Systems
NRECA
Nth Power
NYSERDA
O2 Diesel
Oak Ridge National Laboratory
P/V Enterprises
Pacific Capital Resources, LLC
Pacific Solar Company
Page & Associates
PennWell Communications
Perseus LLC
Philadelphia Gear Company
Pillsbury Winthrop LLP
Power Equipment Associates
Power Generating Inc.
PowerLight Corp.
Price Companies, The
Princeton Energy Resources Int'l
Puerto Rico Electric Power Authority
Renewable Energy Dev. Institute
Renewable EnergyAccess.com

Rockefeller Brothers Fund
RWE Schott Solar
Sacramento Municipal Utility District
Salt River Project
Sandia National Laboratories
Sea Breeze Power Corp.
Shell Solar
SmartPower Connecticut
Solar Electric Power Association
Solar Energy Industries Association
Solar Household Energy Inc.
Solar Integrated Technologies
Solar International Management, Inc.
Solar Outdoor Lighting Inc. (SOL)
Solar San Antonio
Spheral Solar Power Inc.
Sustainable Energy Fund
Taylor Recycling Facility LLC
Technology Transition Corporation
Texas Renewable Energy Industries Assoc
U.S. Conference of Mayors
U.S. DOE
U.S. EPA
UPC Wind Partners LLC
Vencon Management, Inc.
Verdant Power
Verde Investment Group LLC
We Energies
West Penn Power Company
3 Tier Environmental F

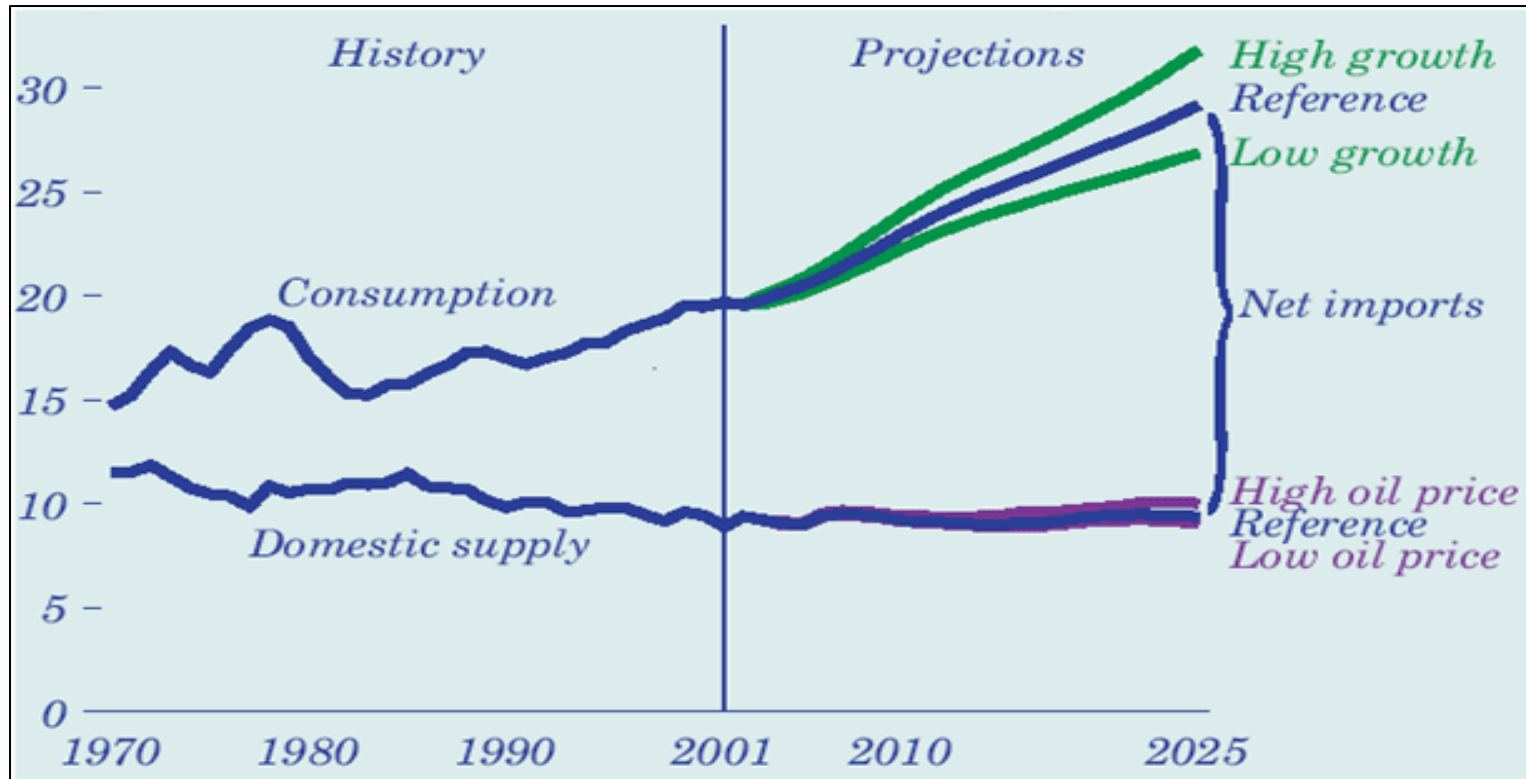
U.S. Energy Consumption by Fuel 2002



Source: AEO 2004 tables (released in December 2003) based on US energy consumption. Overall breakdown Table A1 (Total Energy Supply and Disposition), and Renewable breakdown Table A18 (Renewable Energy, Consumption by Section and Source).

Source: NREL

National Security

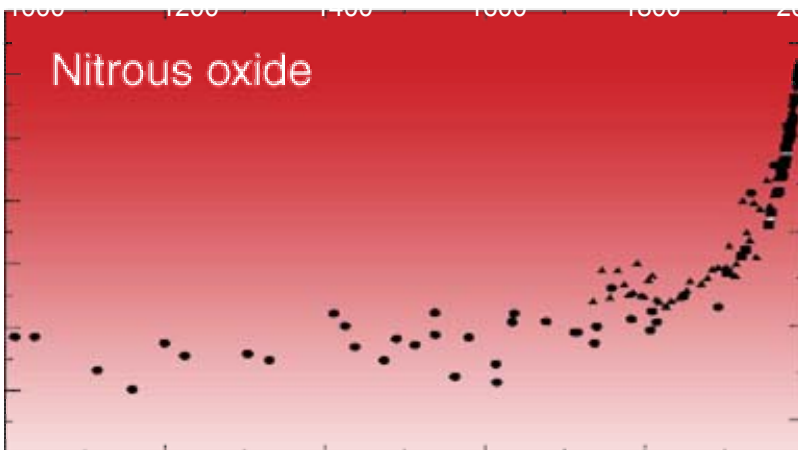
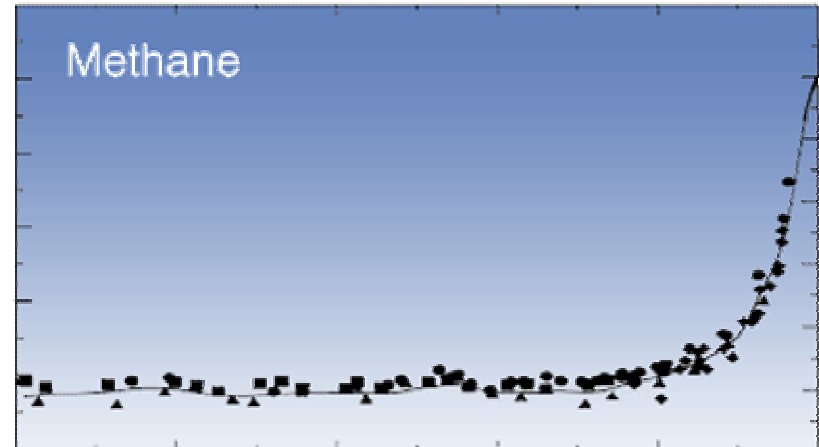
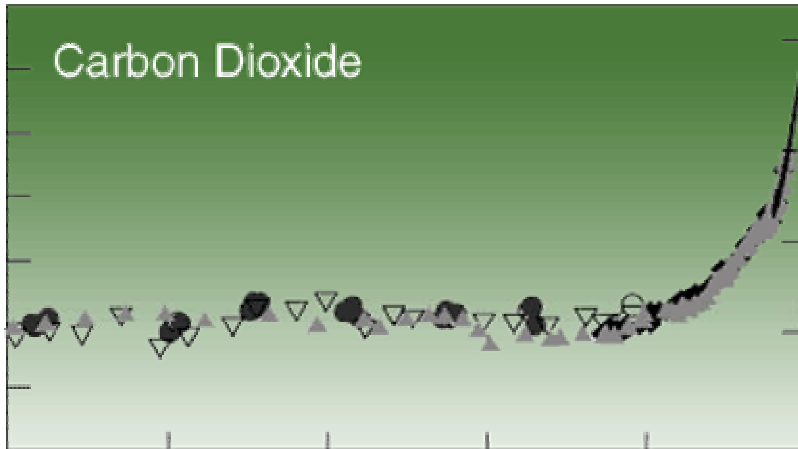


**Petroleum supply, consumption, and imports, 1970-2025
(million barrels per day)**

Source: DOE/EIA-0383(2003) Annual Energy Outlook

National Responsibility

Changes in Atmospheric Concentrations A Thousand Year History



If not now, when?
If not us, who?

Source: NREL

Key Challenges for Energy Supply

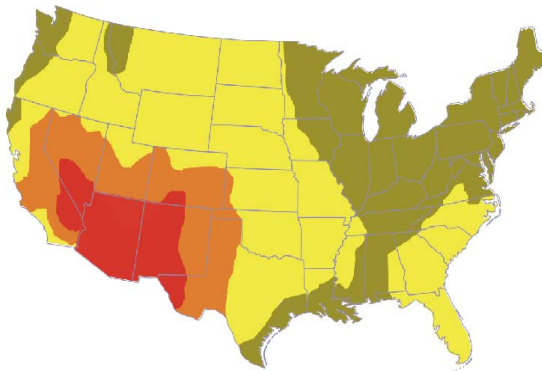
	RES	ECON	FIN RISK	ENVIR	OVERALL	
RENEWABLES	+	-/+	+	+	-	+
NUCLEAR	?	+/?	-	+/-	?	?
COAL	+	+	-	-	+	-
NAT GAS	-	+/?	?	+/-	+	?

Source: American Council On Renewable Energy, 2004

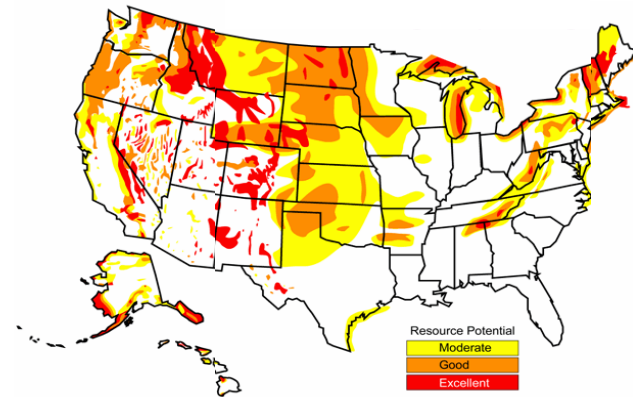
Renewable Energy in America

- Regional Resources, Economics and Politics -

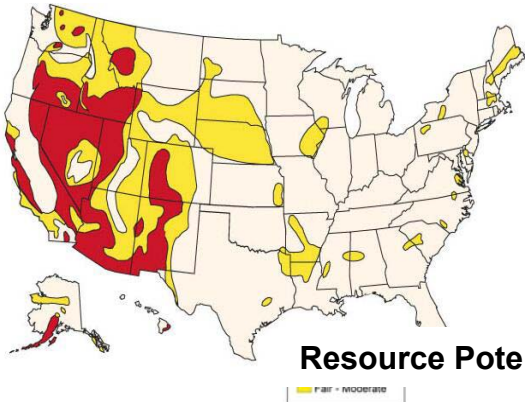
SOLAR ENERGY



WIND POWER

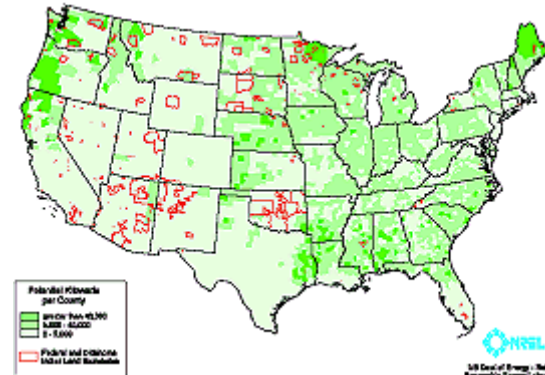


GEO THERMAL



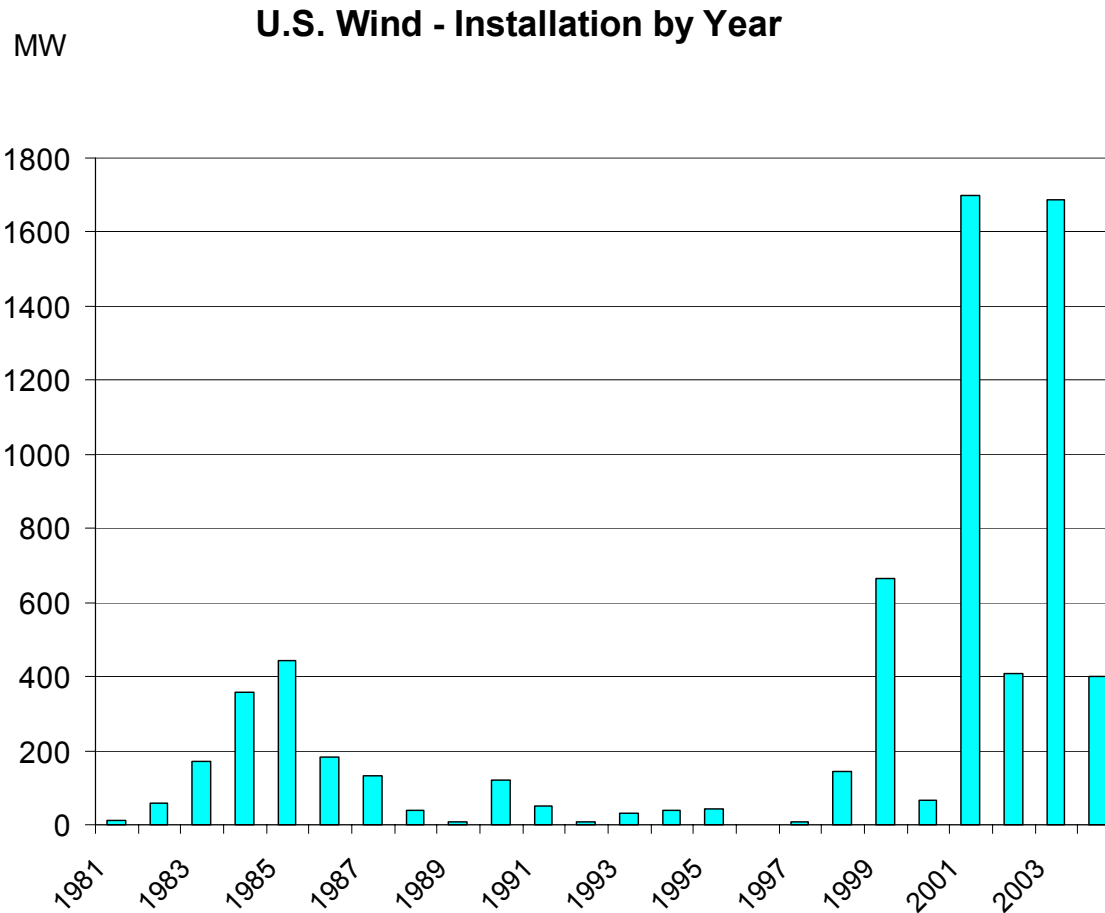
Resource Potential

BIOMASS



Wind Power

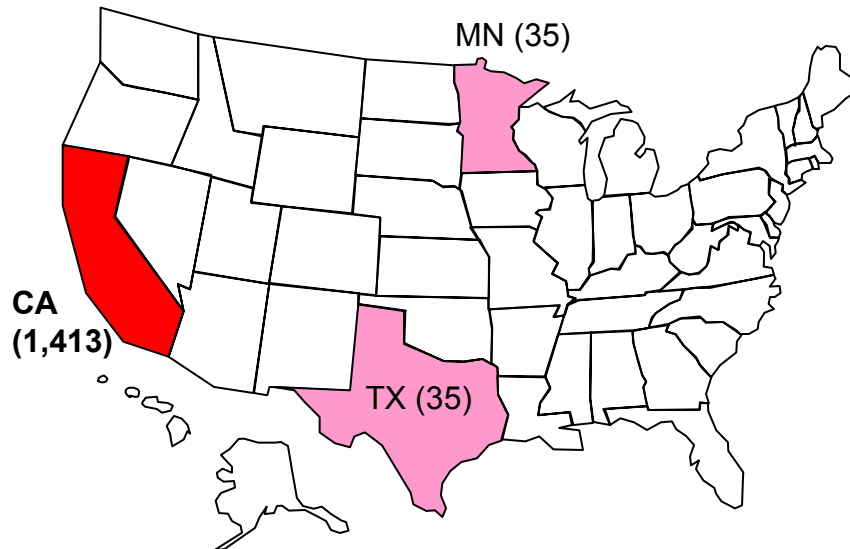
U.S. Wind Energy



Where? – Installations by period by state

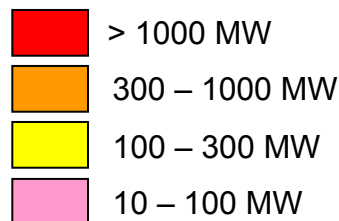
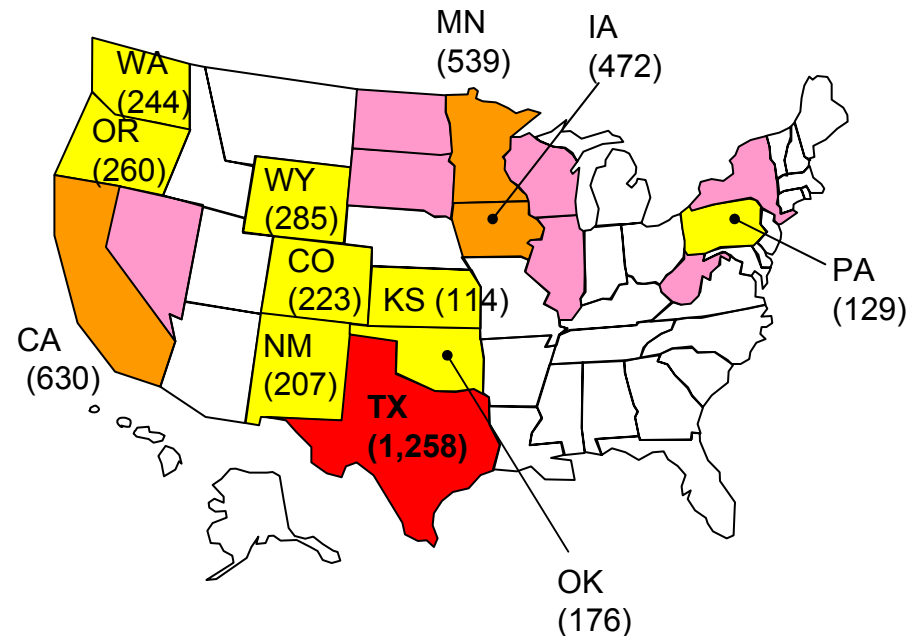
1980-1995

Total: 1,493 MW

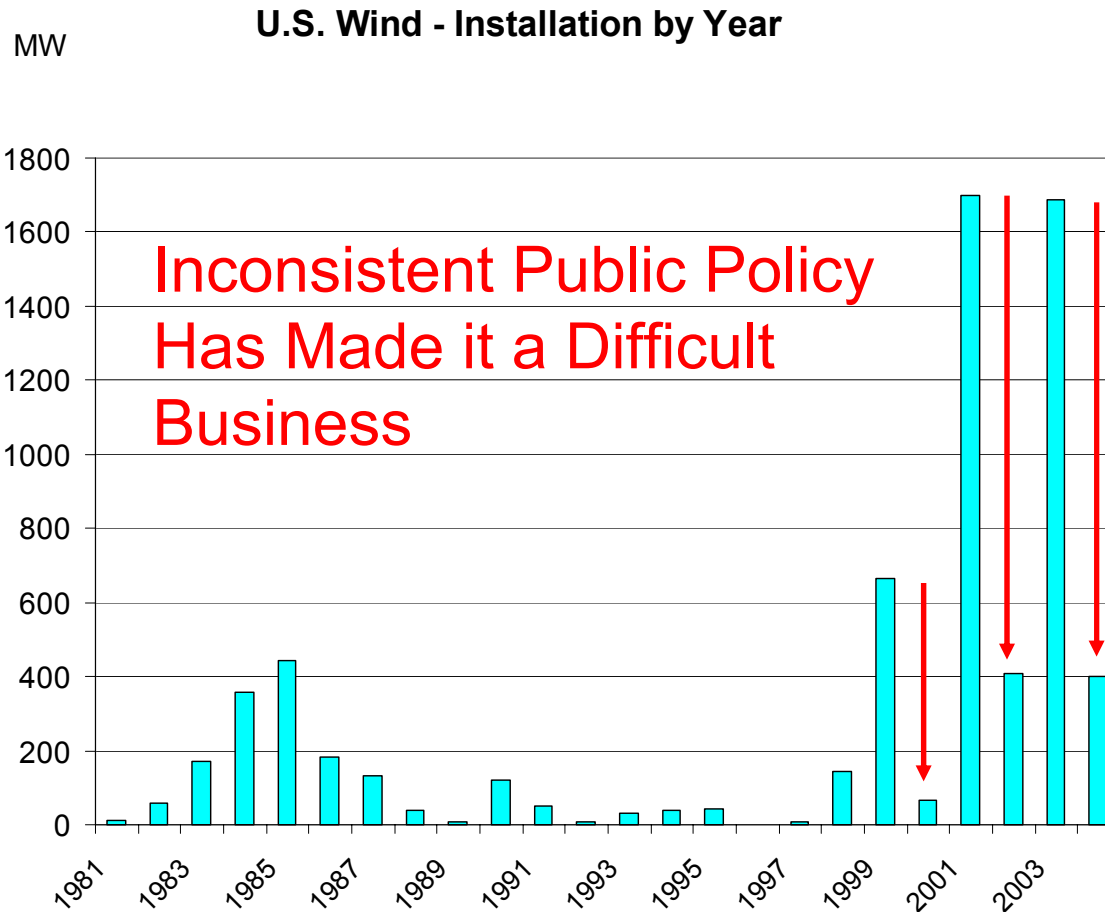


1996-2003

Total: 4,891 MW



U.S. Wind Energy



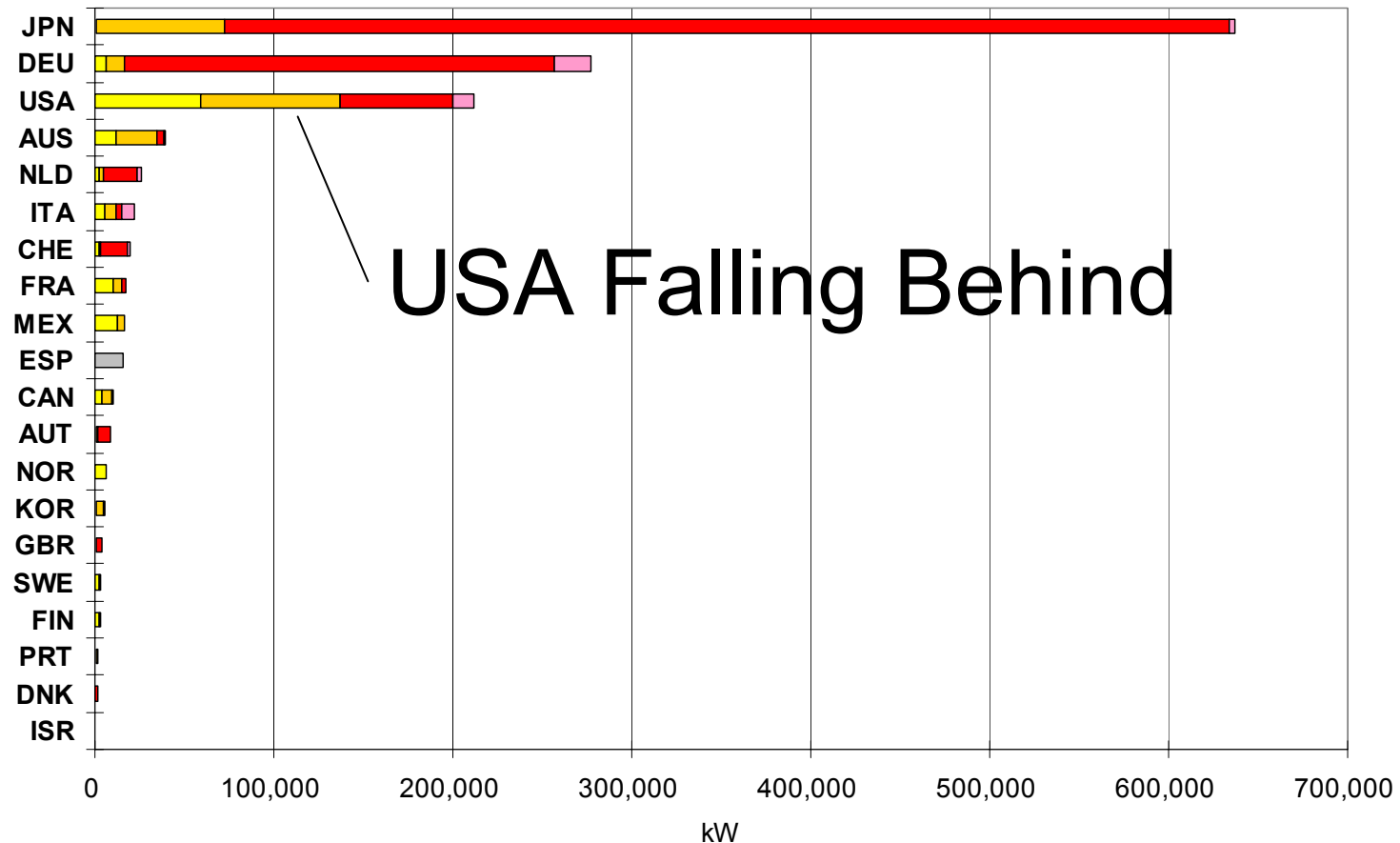
Solar PV

PV Applications



Global PV Installations

Cumulative installed PV power in IEA-PVPS countries as of the end of 2002

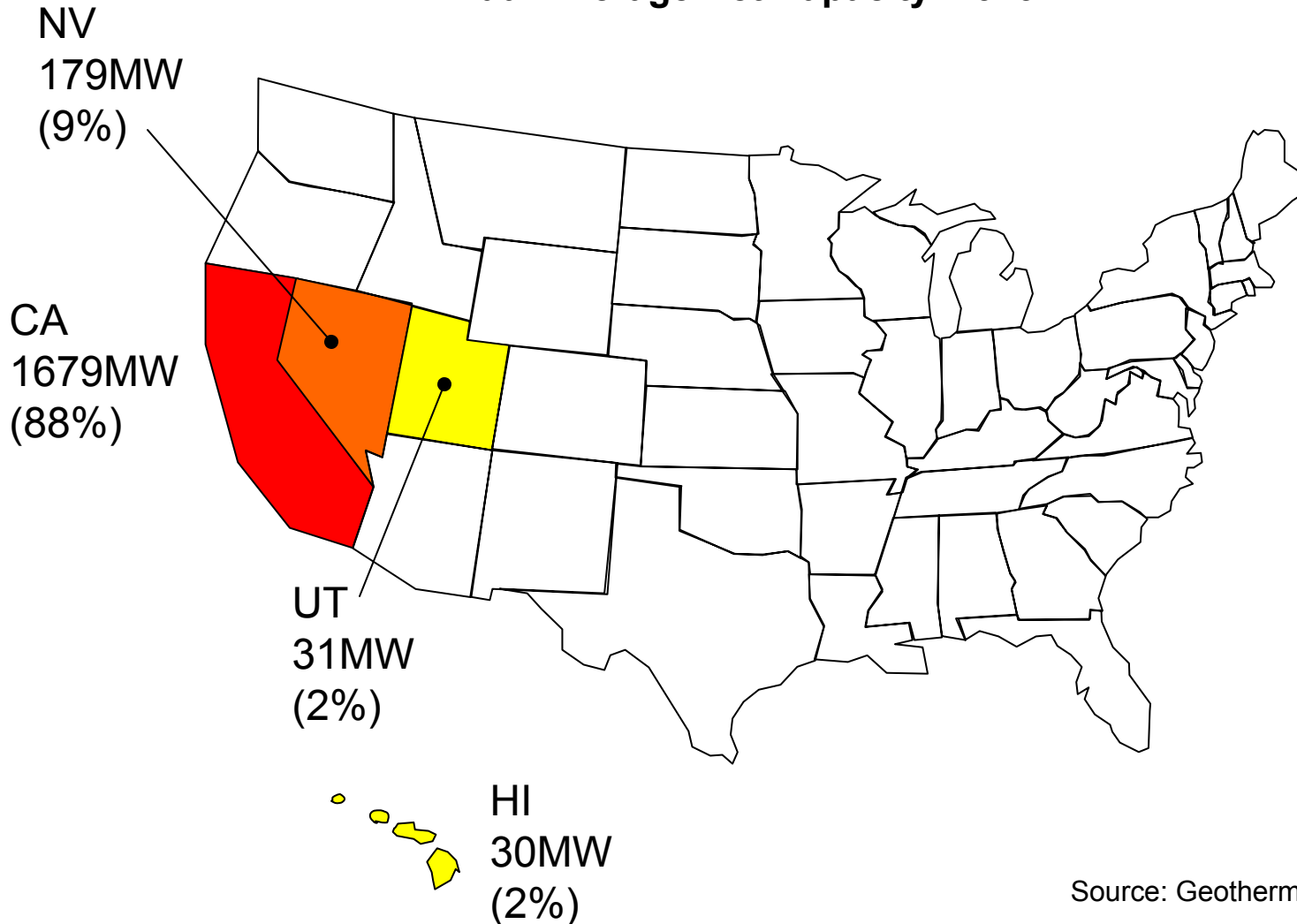


Source: IEA Photovoltaic Power Systems Programme

Geothermal Power Generation

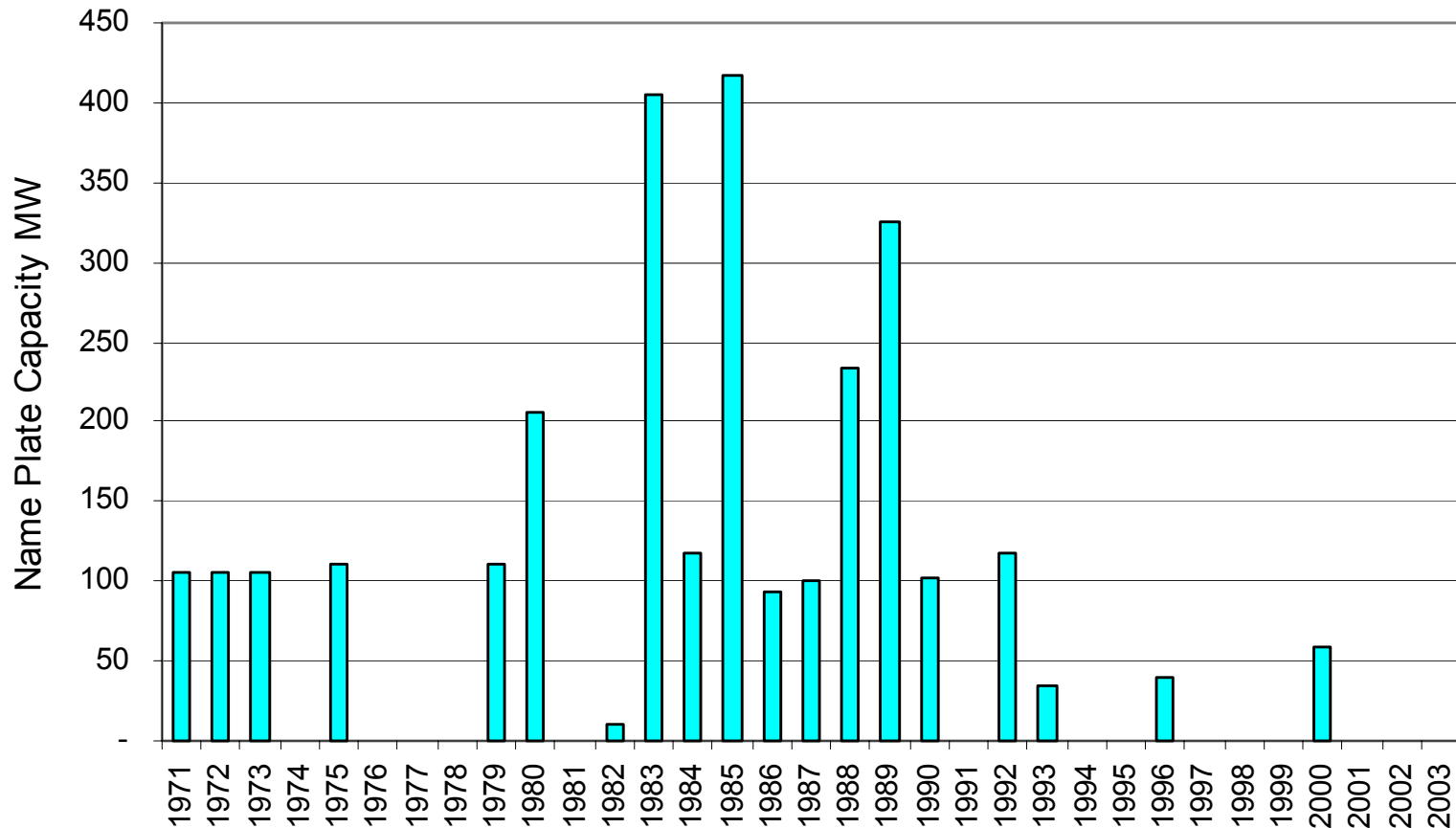
Installations by State

Annual Average Net Capacity: 1919 MW



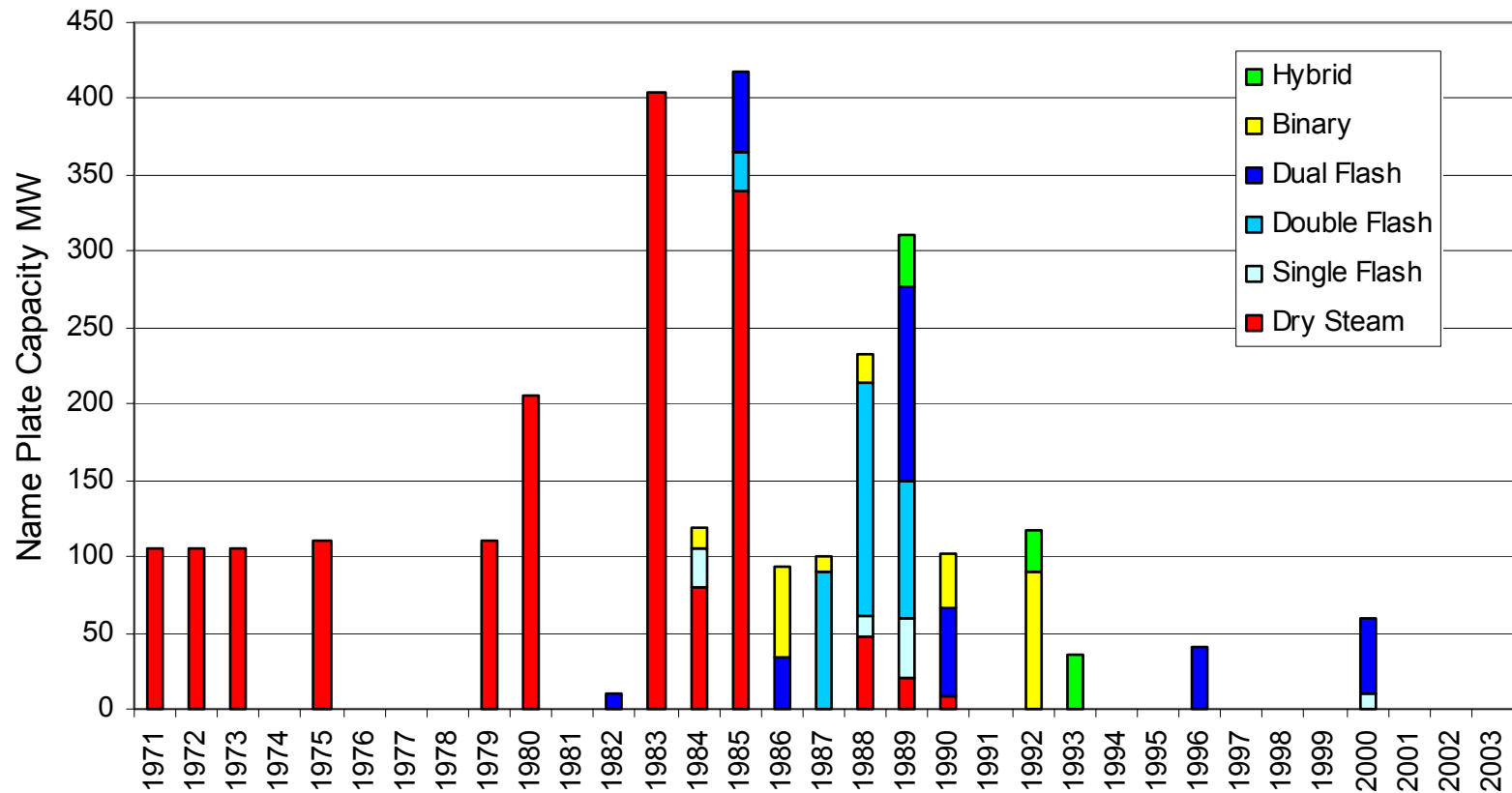
U.S. Geothermal Energy

Annual Installed Capacity



Geothermal Installation by Type

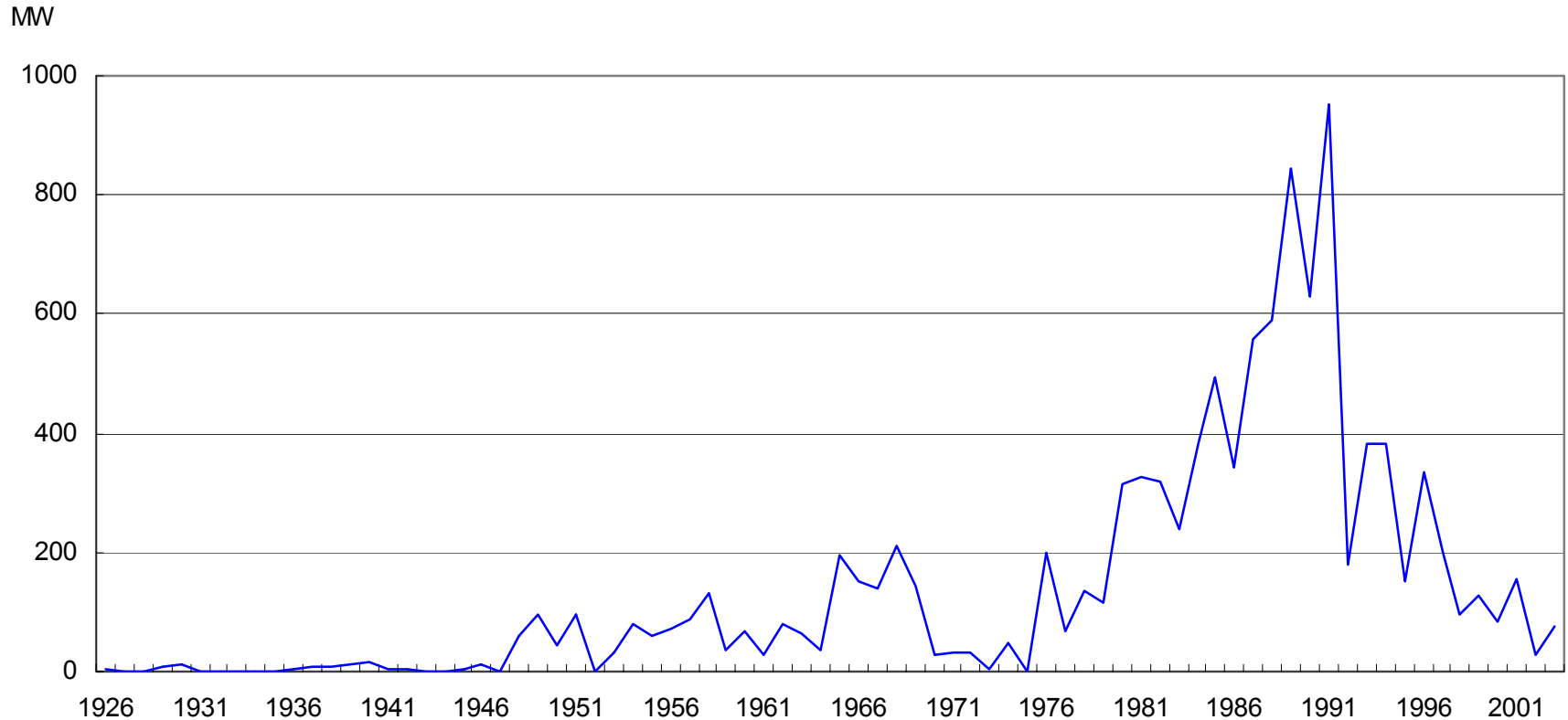
Installed Capacity by Type



Biomass Power Generation

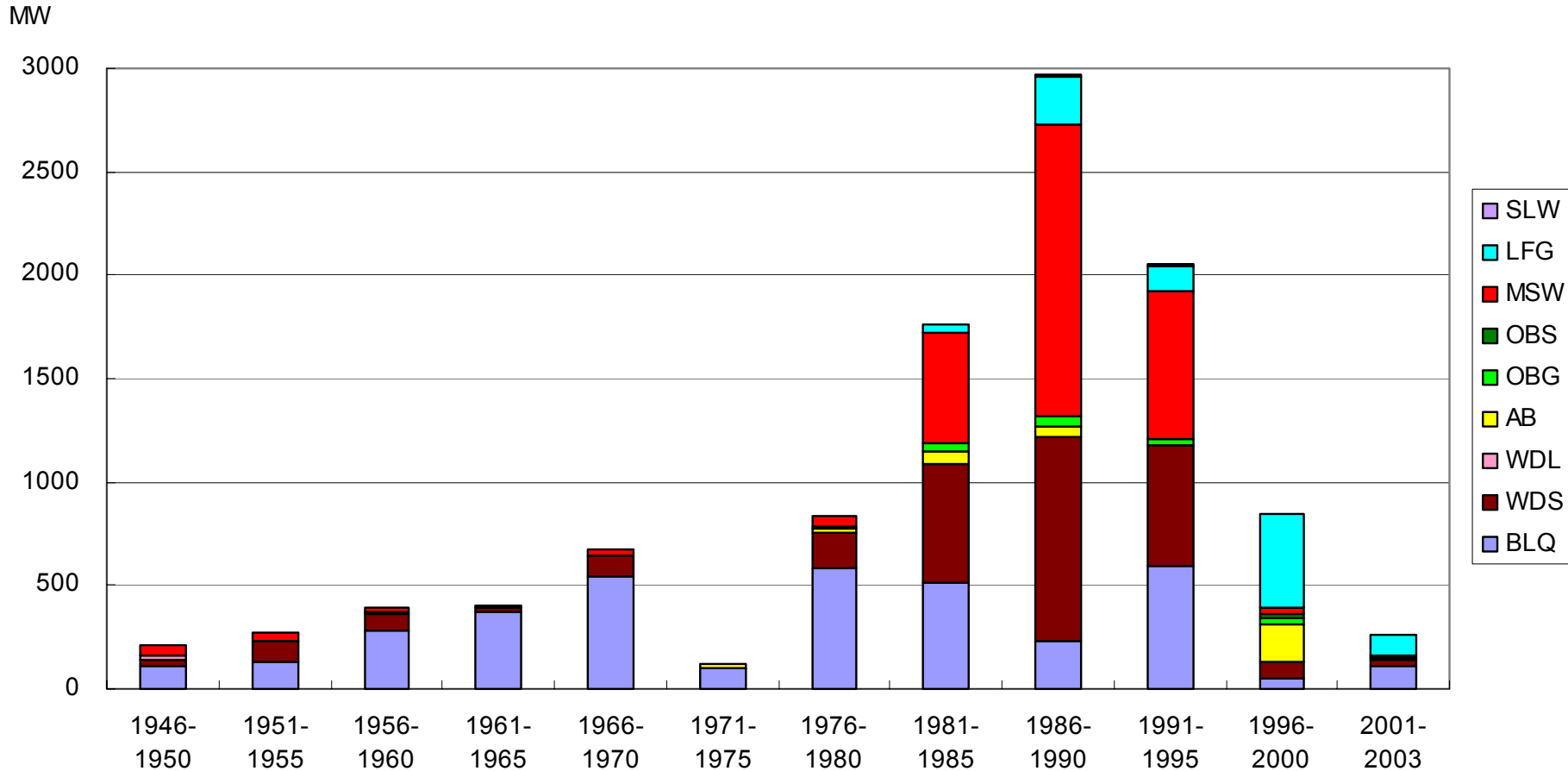
Biomass Installation

Biomass - Yearly Installed Capacity



Biomass Installation by Fuel

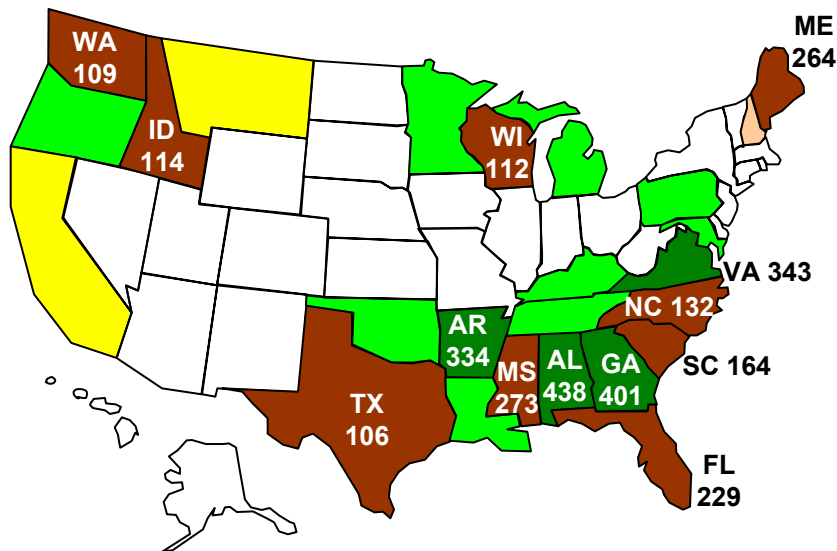
Installed Capacity by Primary Energy Source



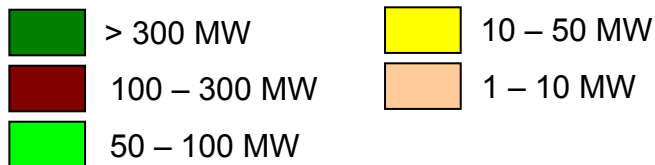
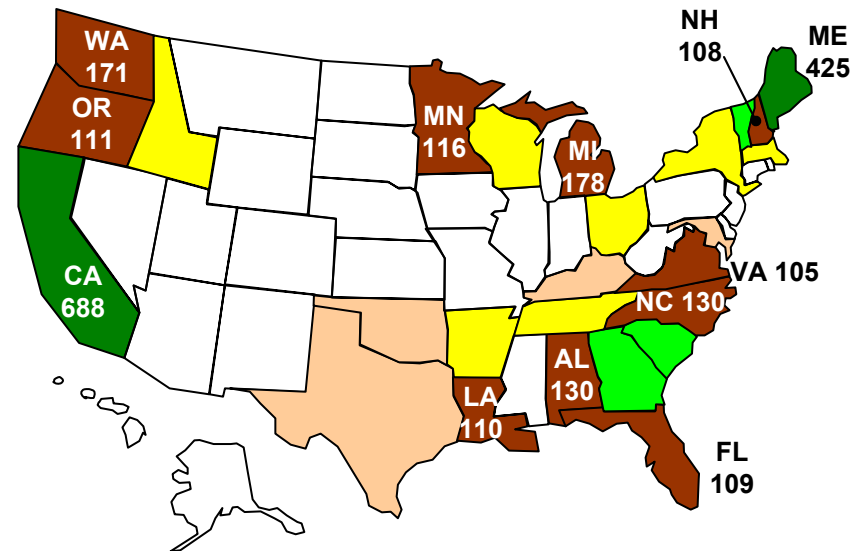
“PURPA Market”

Cumulative Installations by fuel by state

Black Liquor

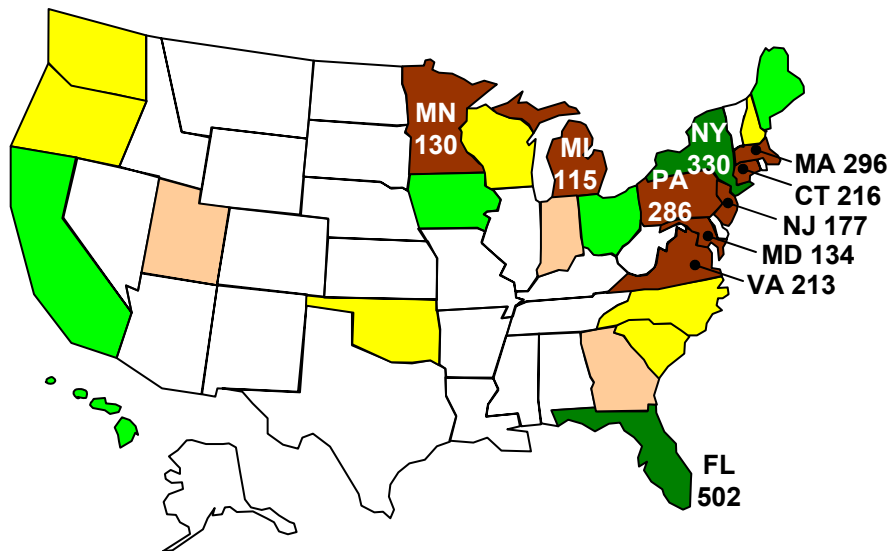


Wood/Wood Waste

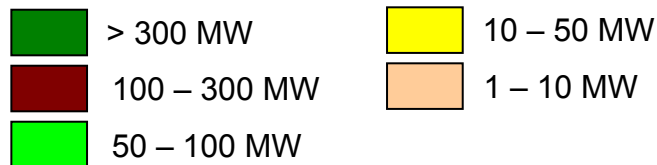
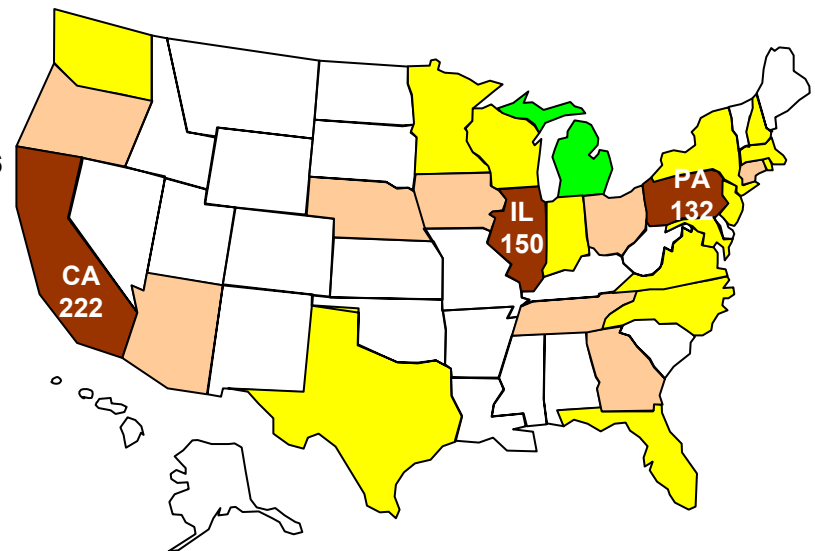


Cumulative Installations by fuel by state

Municipal Solid Waste



Landfill Gas

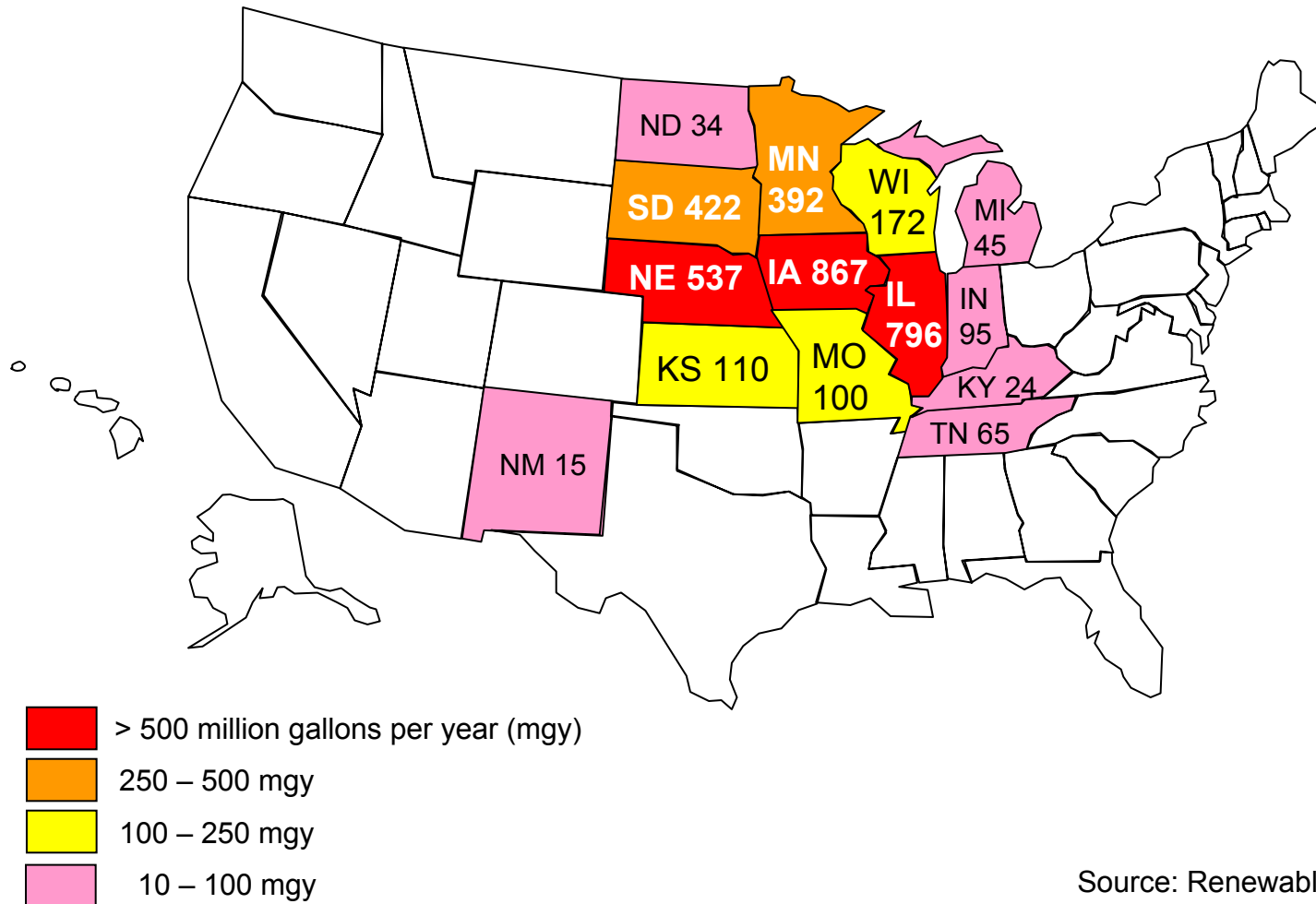


Biofuels

Corn-Based Ethanol

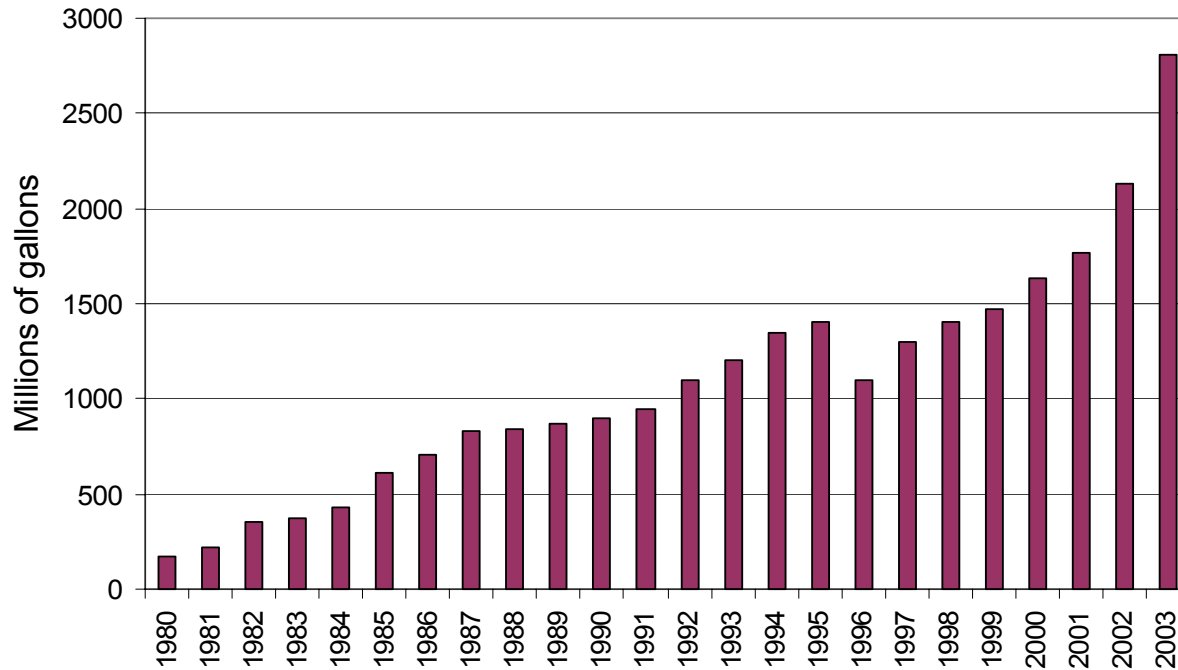
Ethanol Production Capacity by State

Total Production Capacity: 3,699 million gallons per year

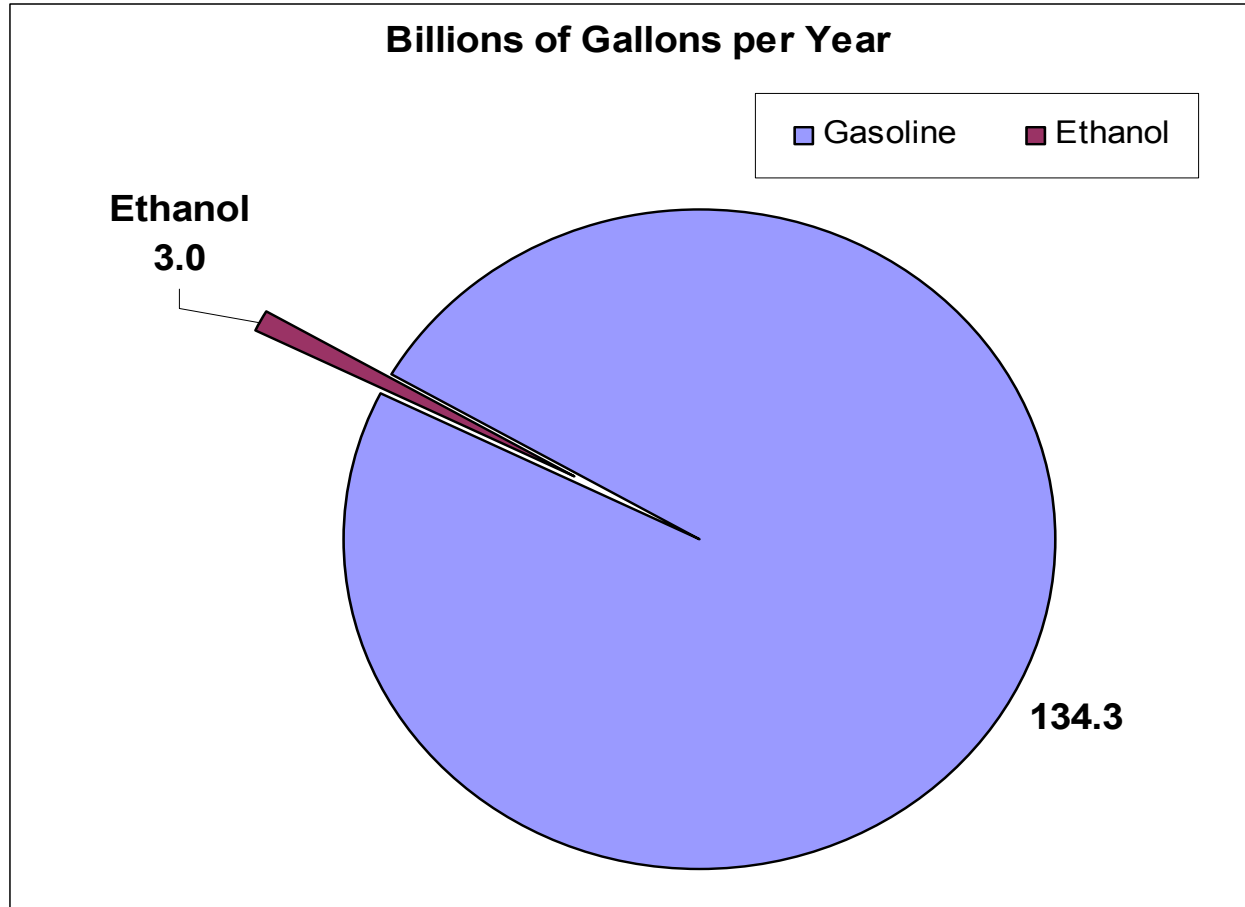


Fuel Ethanol Production

U.S. Fuel Ethanol Production

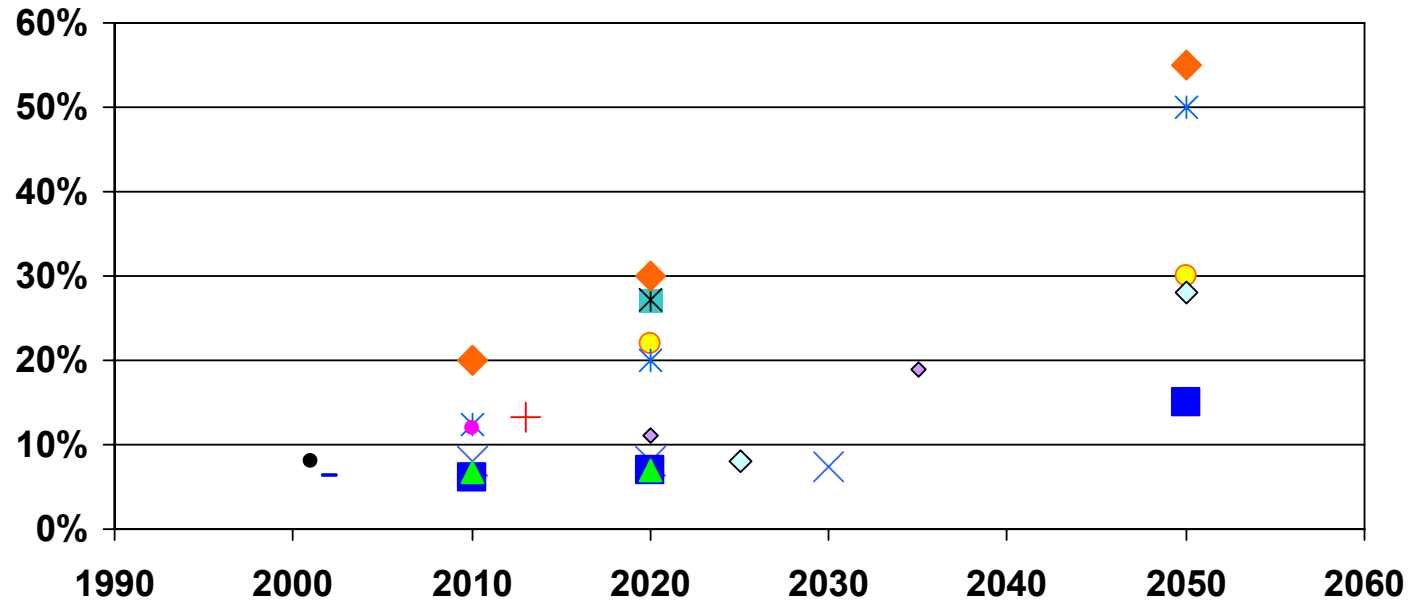


Ethanol Represents just 2% of U.S. Motor Fuels Pie



All Renewables Targets

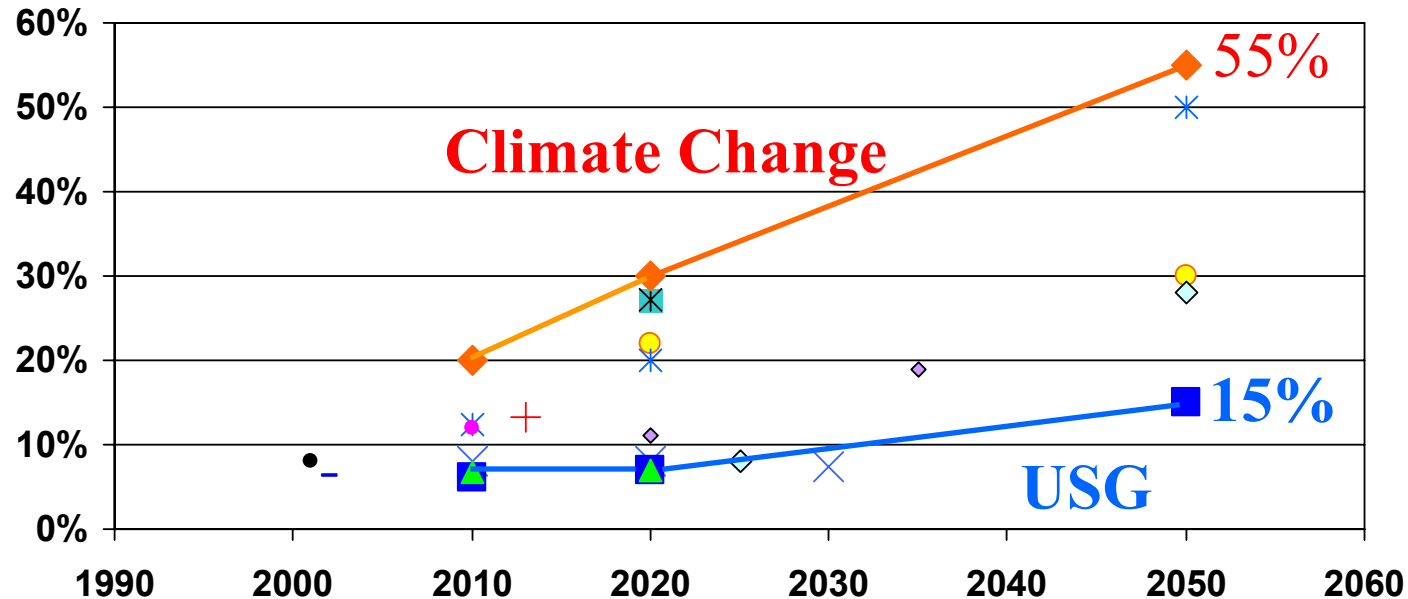
% of Total Energy



Sources:
NREL and ACORE

All Renewables Targets

% of Total Energy



Sources:
NREL and ACORE

Call for “Phase II”



- **Phase I: “Development”**
 - **Focus on RD&D**
 - **Develop Technologies:**
 - **Wind**
 - **Solar**
 - **Hydro**
 - **Geothermal**
 - **Ocean**
 - **Biomass**
 - **Biofuels**
 - **Commercialization**
 - **Federal lead**

- **Phase II: “Utilization”**
 - **Focus on National Needs**
 - **Implement Solutions:**
 - **National energy supply**
 - **National security**
 - **Environment**
 - **Climate change**
 - **Economic growth**
 - **Investment opportunities**
 - **Jobs**
 - **Market Adoption**
 - **State / Federal co-lead**

The Challenge of Financing a Renewable Energy Future

"Renewable Energy Finance Forum – Wall Street"

June 22-23, 2004 in New York City



Gov. Bill Richardson, New Mexico



Main Conference



Reception



New York energy policy leaders



Hermann Scheer, Germany

Bank Lending – Wind and Biofuels



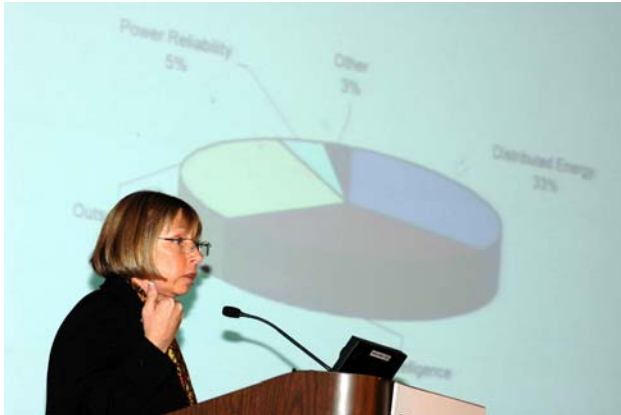
Michael Midden, Dexia



Nick Gardner, Fortis Bank

- **Michael Midden, Dexia Bank, Paris:**
 - New market drivers
 - Changing capital markets
 - Conservative lending
 - Key on quality
- **Nick Gardner, Fortis Bank, London:**
 - Principal risk considerations
 - Wind speed
 - Technology
 - Offtake arrangements
 - Construction
 - Operations and maintenance
 - Syndication

Equity Investing



Nancy Floyd, Nth Power

- **Nancy Floyd, Nth Power**
 - **Venture capital**
 - **25% - 40% ROR goals**
 - **Difficult history**
 - **RE = hot arena**
 - **Caution to new entrants**



Ken Locklin, Clean Energy Group

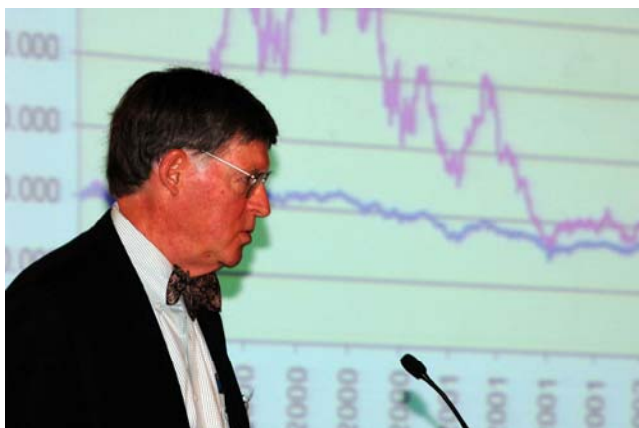
- **Ken Locklin, Clean Energy Group**
 - **Project equity**
 - **15% - 25% ROR goals**
 - **Merchant plant history**
 - **New equity funds forming**

Institutional Investors



Sean Harrigan, President, CalPERS

- **Sean Harrigan, CalPERS**
 - \$150 B pension fund
 - Fiduciary duty
 - Sustainable development
 - Reconciliation
 - \$200 MM commitment



Jack Robinson, President, Winslow Management

- **Jack Robinson, Winslow**
 - \$150 MM mutual fund
 - Up – Down – Up Trends
 - Cautiously optimistic for NT
 - Optimistic for LT
 - Fundamentals of societal change

Public Sector Financial Management



Katie McGinty, PA Secretary of Env.



Smith, Geesman, and Milford

- **Kathleen McGinty, PA**
 - PA is open for business
 - Clean energy funds
 - New \$800 MM bonding
- **Peter Smith, NYSERDA**
 - RD&D and incentives
 - RPS at 25%
- **John Geesman, CEC**
 - PIER R&D plus incentives
 - RPS at 25%
- **Lew Milford, CEG**
 - Clean Energy States Alliance
 - \$3.4 Billion of funding

Summary

- US faces energy issues
- \$14B in RD&D over 30 years
- Wide range of views on the future
- Financing is a key challenge:
 - Debt is looking for cash flow and security
 - Equity is looking for good returns
 - Institutional investors looking for fundamentals
 - Public is looking to leverage private finance
- Wall Street is engaged and interested.

Additional Information

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